

10/045,499

BEST AVAILABLE COPY**REMARKS**

Claims 8-27 are all the claims pending in the application. Claims 8-27 stand rejected on prior art grounds. In addition, claims 21-27 are objected to as being duplicates of claims 1-7. Applicants respectfully traverse these rejections based on the following discussion.

I. The Prior Art Rejections

Claims 8-11, 13-18, 20, 21-24 and 26-27 stand rejected under 35 U.S.C. §102(e) as being anticipated by Noble, Jr. (hereinafter "Noble"). Claims 12, 19 and 25 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Noble, Jr. taken with Kenney. Applicants respectfully traverse these rejections based on the following discussion.

A. The Rejection Based on Noble, Jr.

Applicants respectfully traverse this rejection because the claimed invention leaves a portion of the collar 12 against the trench sidewall to prevent the lip strap 26 from contacting the trench sidewall (see Applicants' Figure 4) while Noble allows the lip strap 52 to contact the sidewall as shown in Figures 4-6 of Noble. Applicants' independent claims, 8, 15, and 21 provide that the "recessing allows a portion of said collar to remain in contact with the wall of said trench such that said collar separates said lip strap from said wall of said trench." Therefore, Applicants respectfully submit that the claimed process is not taught or suggested by Noble.

As explained on page 5, lines 3-9 of the application, one benefit of the invention is the formation of a connection between the strap and the conductor that is at the surface of the semiconductor device. This surface connection allows better control of leakage current and, as a result, is much more scalable. Therefore, as shown in Applicants' Figure

10/045,499

BEST AVAILABLE COPY

4, the lip strap 26 is prevented from contacting the sidewall of the trench 11. Therefore, there is only a surface connection between the strap 26 and the conductor that is at the surface of the semiconductor device and no sidewall connection will be formed with the inventive process. This occurs because the claimed process performs a specific type of recessing of the collar and pad oxide as shown in Figure 3, that allows a portion of the collar to remain along the sidewall 11 of the trench. This recessing prevents the strap 26 from contacting the sidewall 11, as shown in Figure 4.

To the contrary, as shown in Figures 4-6 of Noble, the lip strap 52 is connected to both the upper surface of the device and the sidewall of the trench. Further, as explained in column 4, lines 18-24, Noble requires that the trench collar 14 be etched to expose surfaces of the sidewall of the trench. This allows the strap 52 to connect to the trench polysilicon region 40. However, as clearly shown in Figures 4-6, this recessing process described in Noble is different than the claimed recessing process because Noble etches the collar material 14 from the sidewall to expose the sidewall and allow the lip strap 52 to contact the sidewall of the trench.

Thus, as shown above, it is Applicants' position that the applied prior art reference Noble does not teach or suggest that the "recessing allows a portion of said collar to remain in contact with the wall of said trench such that said collar separates said lip strap from said wall of said trench" as defined by independent claims 8, and 15, and similarly defined by independent claim 21. Therefore, it is Applicants' position that independent claims 8, 15, and 21 are patentable over the prior art of record. Further, Applicants note that dependent claims 9-11, 13, 14, 16-18, 20, 22-24, and 26-27 are similarly patentable because of their dependency from patentable independent claim and also because of the additional features of the invention defined. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

B. The Rejection Based on Noble, Jr. taken with Kenney

The Kenney reference is relied upon for teaching silicon oxide and silicon nitride thin node dielectric layers and is not proposed a teaching the inventive recessing process that allows a portion of the collar to remain in contact with the wall of the trench.

10/045,499

BEST AVAILABLE COPY

Further, Kenney does not teach or suggest this feature. Therefore, any combination of Noble with Kenney would not teach or suggest the invention defined by independent claims 8, 15, and 21, because any such combination would not teach or suggest that the "recessing allows a portion of said collar to remain in contact with the wall of said trench such that said collar separates said lip strap from said wall of said trench." Thus , it is Applicants' position that independent claims 8, 15, and 21 are patentable over the proposed combination of references. In addition, dependent claims 12, 19, and 25 are patentable not only because they depend from a patentable claim, but also because of the additional features they define. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw this rejection.

II. Formal Matters and Conclusion

With respect to the objection to the claims, claim 21 has been amended, above, to overcome this objection. More specifically, some unnecessary limitations have been removed from claim 21 so as to broaden claim 21 and distinguish it from independent claim 1. In view of the foregoing, the Examiner is respectfully requested to reconsider and withdraw the objections to the claims.

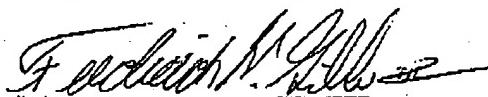
In view of the foregoing, Applicants submit that claims 8-27, all the claims presently pending in the application, are patentably distinct from the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

10/045,499

Please charge any deficiencies and credit any overpayments to Attorney's Deposit
Account Number 09-0458.

Respectfully submitted,



Frederick W. Gibb, III
Reg. No. 37,629

Date: 11/19/03
McGinn & Gibb, PLLC
2568-A Riva Road, Suite 304
Annapolis, Maryland 21401
(301) 261-8071
Customer No. 29154

BEST AVAILABLE COPY